



HDF-EOS Development Current Status

Larry Klein, Shen Zhao and Ray Milburn

L-3 Communications EER Systems, Inc.

December 5, 2002

Larry.Klein@L-3com.com, szhao@eos.east.hitc.com



HDF-EOS 2

- HDF4 based, storage format for EOS standard products.
- Used operationally by MODIS, MISR, ASTER, Landsat, AIRS and other EOS instruments
- Support for Grid/Point/Swath structures
- **HDF4 and HDF-EOS 2 will be supported by NCSA and NASA for the fore-seeable future.**



Current Archive Holdings

- GSFC DAAC: AIRS, MODIS L1, L2 Atmos./Ocean
 - 900 TB
- EDC DAAC: Landsat/ASTER/MODIS Land
 - 500 TB
- Langely DAAC: MISR
 - 300 TB
- NSIDC DAAC: MODIS L2, L3
 - 20 TB



HDF-EOS 5

- Based on HDF5, a complete rewrite of HDF4 with a different interface.
 - First released in 2000.
- Designed to ‘resemble’ HDF-EOS 2 to the maximum extent possible.
 - Supports same data structures
 - Added prefix ‘HE5_’ to HDF-EOS 2 functions.
 - Doesn’t preclude HDF5 functionality.
 - Data Type changes, e.g. INT64 -> H5T_NATIVE_LONG



HDF-EOS 2 -> HDF-EOS 5

- HDF-EOS 2

SWdefdatafield(swathID, fieldname, dimlist, numtype, merge)

- HDF-EOS 5

HE5_SWdefdatafield(swathID, fieldname, dimlist, maxdimlist, numtype, merge, Maxdimlist*)

*New HDF5 functionality passed through. This allows the user to set an upper limit to the size of the dataset.

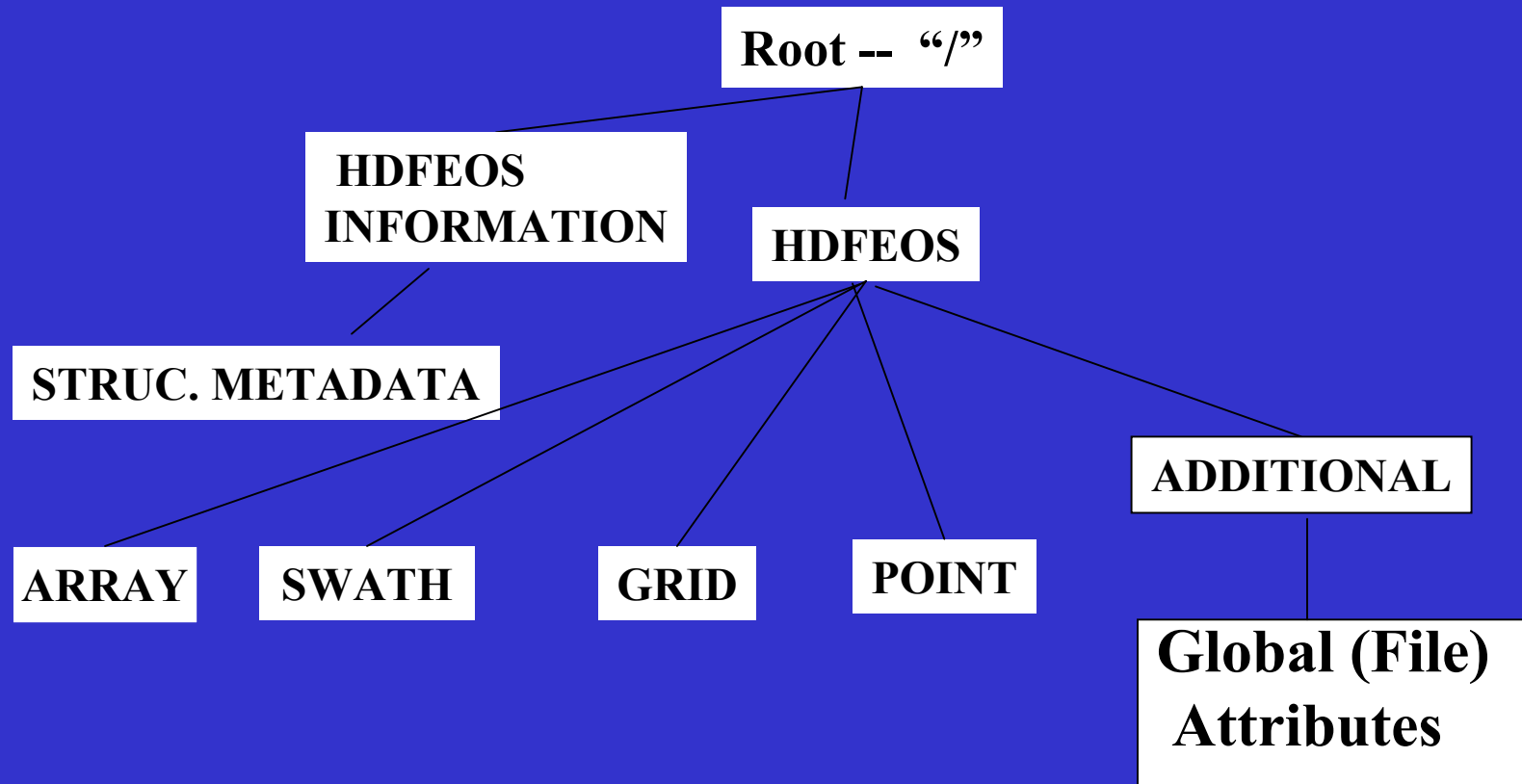


HDF-EOS 5

- Provide a conversion tool: heconvert
 - HDF-EOS 2 -> HDF-EOS 5
 - compliments HDF4 -> HDF5 conversion tool
- HDF-EOS 5 will be used by EOS Aura
 - Standard format for profile data developed
- One GLAS summary product in HDF-EOS 5
- **Assume that HDF-EOS 2 producers will convert when PI's determine that the time is right.**



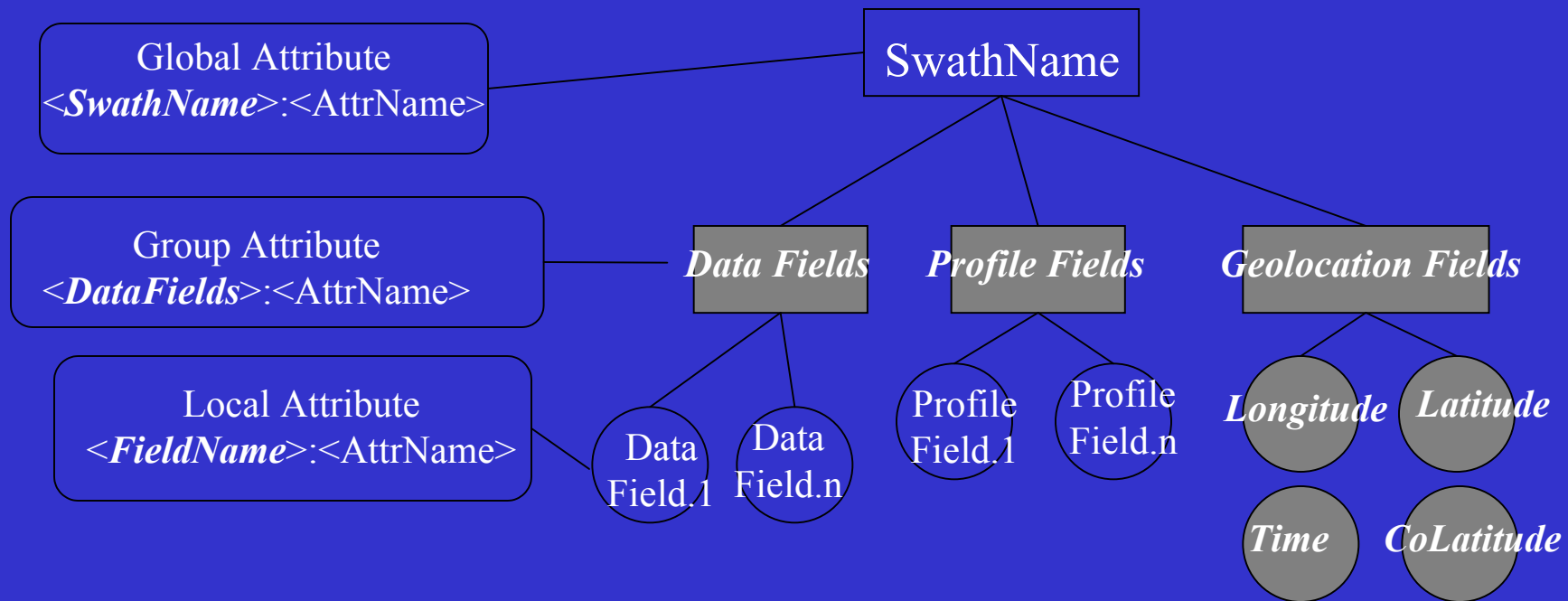
Top Level of HDF-EOS 5 File



The new ADDITIONAL Group has global (file) attributes
The new functionality is added to the EH(utility) interface.

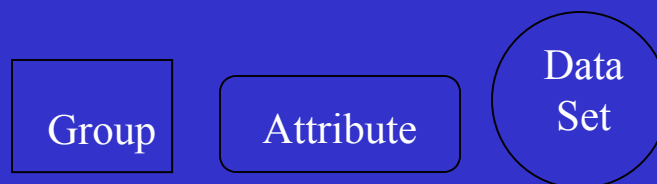


Swath Structure



Each Data Field can have
Attributes and/or
Dimension Scales

Shaded Objects are implemented
in a fixed way so the user doesn't
have direct access via the interface





HDF-EOS 5 Functionality

- Basic File I/O
- Fill Values
- Compression
- Chunking/Tiling
- Swath Interface
- Grid Interface
- Point Interface
- Profile Interface
- Generalized Array Interface (Zonal Avg.)
- Global (File), Group & Local Attributes
- External Data Files
- Subsetting
- Unix/Linux/Windows
- Threadsafe Version
- FORTRAN, C, C++



ECS support of HDF5

- ECS toolkit V 5.2.8 supports HDF4 and HDF5 - based applications
 - HDF-EOS 2.8 (hdf4.1r5)
 - HDF-EOS 5.3 (hdf5-1.4.3)
- HDF5 and HDF4 must both be compiled
 - HDF4 users not affected
 - HDF5 users must use PGS_MET_SDstart() and PGS_MET_SDend()



ECS support of HDF5

- Both flavors of HDF-EOS (HDF) are part of the ECS baseline.
- OS's: Sun, SGI, IBM, HP, DEC, Windows NT/98, Linux
- Compilers: FORTRAN 77/90, C, C++.
- ECS will not crack HDF5 - based files for near future. (contents transparent to archive)
- Size limit is 2 GBytes



Applications

- HE5View (HDF-EOS 5 browser)
- Java EOS Browser (HDF-EOS 2 and 5 access)
- HDF-EOS processor: convert to GeoTIFF, subset, mosaic, subsample. In Data Pool interface (HDF4 based only)
- heconvert (convert HDF-EOS 2 Grid/Point/Swath to HDF-EOS 5 equivalents)
- Access libraries and applications at:
<http://newsroom.gsfc.nasa.gov/sdptoolkit/toolkit.html>



Issues

- Only gzip (deflate) compression method implemented.
- Metadata not updated for swath stitching in unlimited dimension.
- File size limit in ECS - Is two Gbytes enough?
- Currently in maintenance mode, but user requests are always welcome.